

Oribatid mites from the vicinities of Dhati-Walal National Park, Ethiopia

(Acari, Oribatida)

Sergey G. Ermilov & Leonid B. Rybalov

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The present study is based on oribatid mite material (Acari, Oribatida) collected from the vicinities of Dhati-Walal National Park in Ethiopia in 2017. A list of identified taxa, including 56 species from 46 genera and 25 families is provided; of these, 10 species and 4 genera are recorded for the first time in the fauna of this country. A new species of the genus *Sadocephus* (Compactozetidae) is described; *Sadocephus dhatiwalalensis* Ermilov sp. nov. differs from *Sadocephus subniger* (Ewing, 1917) by the larger body size, truncate lamellar cusps with lateral and medial points and brush-shaped, erect bothridial setae. The species *Scheloribates leleupi* Balogh, 1959 (Scheloribatidae) is redescribed and illustrated in detail, based on specimens from Ethiopia; the main morphological traits for this species are summarized. Morphological additions to the description of *Galumna incisa* Mahunka, 1982 (Galumnidae) are presented.

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Introduction

This work is based on oribatid mite material collected from the vicinities of Dhati-Walal National Park in Ethiopia during the Russian-Ethiopian expeditions in 2017. The primary goal of the paper is to present a list and new findings (new records) of identified taxa.

During taxonomic identification, we found one new species, belonging to the genus *Sadocephus* Aoki, 1965 of the family Compactozetidae. The secondary goal of the paper is to describe this new species. *Sadocephus* was proposed by Aoki (1965) with *Sadocephus undulatus* Aoki, 1965 as type species. At present, the genus comprises 13 species and one subspecies, which collectively have a semi-cosmopolitan distribution (Subías 2004, updated 2018). The main generic traits of *Sadocephus* are presented in Ermilov & Corpuz-Raros (2017).

The third goal of the paper is to present a supplementary description of *Scheloribates leleupi* Balogh, 1959 (Scheloribatidae), on the basis of specimens from Ethiopia, adding new information about some morphological structures and their measurements, identification of leg setae and solenidia, and morphology of the gnathosoma.

The fourth goal of the paper is to present morphological additions on the Ethiopian species *Galumna incisa* Mahunka, 1982 (Galumnidae).

Material and methods

Material examined

The material was collected from:

#1 Ethiopia, Dhati-Walal National Park, 9°23'54.7"N, 34°40'10.7"E, forest with *Schefflera* and *Coffee*, soil (0–10 cm), 19.X.2017 (collected by L. B. Rybalov).

- #2 same as #1, but litter.
- #3 same as #1, but mosses on trees.
- #4 Ethiopia, Dhati-Walal National Park, 9°26'33.7"N, 34°47'22.5"E, mixed deciduous forest in the valley, litter, 27.X.2017 (collected by L. B. Rybalov).
- #5 Ethiopia, Dhati-Walal National Park, 9°26'35.5"N, 34°48'07.6"E, rarefied forest with needle leaves bush, litter, 27.X.2017 (collected by L. B. Rybalov).
- #6 Ethiopia, Dhati-Walal National Park, 9°26'34.6"N, 34°48'02.1"E, bamboo forest, litter, 20.X.2017 (collected by L. B. Rybalov).
- #7 Ethiopia, near Dhati-Walal National Park, 9°25'01.2"N, 34°45'21.3"E, mixed forest on the mountain, litter, 20.X.2017 (collected by L. B. Rybalov).

Methods

Litter and fallen leaves were collected by using a stainless steel frame (50 × 50 cm) with a sieve (mesh size 2 × 2 cm). Moss was collected by hand method. Mites extracted in 75 % ethanol using Berlese's funnels with electric lamps (150 W) in laboratory conditions.

Specimens were mounted in lactic acid on temporary cavity slides for identification of all taxa and for measurement and illustration of the new species. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the notogaster. Notogastral width refers to the maximum width of notogaster in dorsal view. Lengths of body setae were measured in lateral aspect. All body measurements are presented in micrometers. Formulas for leg setation are given in parentheses according to the sequence trochanter-femur-genu-tibia-tarsus (famulus included). Formulas for leg solenidia are given in square brackets according to the sequence genu-tibia-tarsus.

Drawings were made with a camera lucida using a Leica transmission light microscope "Leica DM 2500".

General morphological terminology used in this paper mostly follows that of F. Grandjean: see Travé & Vachon (1975) for references, Norton (1977) for leg setal nomenclature, and Norton & Behan-Pelletier (2009) for an overview.

The following abbreviations are used: *lam* – lamella; *slam* – sublamella; *plam* – prolamella; *tu* – tutorium; *kf* – lateral keel-shaped ridge; *L* – lamellar line; *S* – sublamellar line; *N* – prodorsal leg niche; *E, T* – lateral ridges of prodorsum; *ro, le, in, bs, ex* – rostral, lamellar, interlamellar, bothridial and exobothridial setae, respectively; *ht* – humeral tooth; *Ad* – dorsosejugal porose area; *D* – dorsophragma; *P* – pleurophragma; *Ah* – humeral porose area; *c, la, lm, lp, h, p* – notogastral setae; *Sa, S1, S2, S3* – notogastral sacculi; *mp* – median pore; *ia, im, ip, ih, ips* – notogastrallyrifissures; *gla* – opisthonal gland opening; *h, m, a* – subcapitular setae; *sac* – subcapitular saccule; *or* – adoral seta; *v, l, d, cm, acm, ul, sul, vt, lt* – palp setae; *o* – palp and leg solenidion; *cha, chb* – cheliceral setae; *Tg* – Trägårdh's organ; *Pd I, Pd II* – pedotecta I, II, respectively; *pdr* – ridge of pedotectum; *1a, 1b, 1c, 2a, 3a, 3b, 3c, 4a, 4b, 4c* – epimeral setae; *dis* – discidium; *cp* – circumpedal carina; *pr* – podosomal ridge; *g, ag, an, ad* – genital, aggenital, anal and

adanal setae, respectively; *iad* – adanal lyrifissure; *p.o.* – preanal organ; *Amar* – marginal porose area; *Ap* – postanal porose area; *Tr, Fe, Ge, Ti, Ta* – leg trochanter, femur, genu, tibia and tarsus, respectively; *tipr* – process of tibia; *trt* – tooth of trochanter; *p.a.* – leg porose area; *σ, φ* – leg solenidia; *ε* – tarsus I famulus; *v, bv, b, l, d, ft, tc, it, p, u, a, s, pv, pl* – leg setae.

The following abbreviations of collections are used: SMNH – Senckenberg Museum of Natural History, Görlitz, Germany; TSUMZ – Tyumen State University Museum of Zoology, Tyumen, Russia.

Fauna

List of identified taxa*

Epilohmanniidae

Epilohmannia minuta Berlese, 1920. Localities: 1 (14 ex.), 5 (1 ex.), 6 (1 ex.). Distribution: tropics, subtropics.

Nothridae

Nothrus crassisetos Mahunka, 1982. Localities: 3 (2 ex.), 6 (1 ex.). Distribution: Ethiopia.

Plasmobatidae

Plasmobates foveolatus Ermilov, Sidorchuk & Rybalov, 2010. Localities: 5 (2 ex.), 6 (4 ex.). Distribution: Ethiopia.

Gymnodamaeidae

Arthrodamaeus johanni Hugo, 2010. Locality: 5 (1 ex.). Distribution: Ethiopian region.

Damaeidae

Metabelba glabriseta Mahunka, 1982. Locality: 7 (1 ex.). Distribution: Ethiopian region.

Compactozetidae

Sadocepheus dhatiwatalensis Ermilov sp. nov. Locality: 2 (8 ex.). Distribution: Ethiopia.

Liacaridae

Liacarus paratanzicus Ermilov, Rybalov & Kemal, 2011. Locality: 6 (1 ex.). Distribution: Ethiopia.

* Distribution: mostly from Subías (2004, updated 2018). Ptyctimous mites: not included. Except the holotype, specimens examined are deposited in TSUMZ.

Eremulidae

Eremulus avenifer Berlese, 1913. Localities: 4 (1 ex.), 7 (2 ex.). Distribution: Palaearctic, Oriental and Ethiopian regions, Polynesia. New record of the species in Ethiopia.

Eremobelidae

Eremobelba tuberculata Mahunka, 1982. Locality: 7 (3 ex.). Distribution: Ethiopia.

Basilobelidae

Basilobelba gigantea Ermilov, Sidorchuk & Rybalov, 2011. Localities: 2 (6 ex.), 4 (11 ex.), 7 (11 ex.). Distribution: Ethiopia.

Dameolidae

Fosseremus laciniatus (Berlese, 1904). Locality: 4 (1 ex.). Distribution: Cosmopolitan.

Machadobelidae

Machadobelba symmetrica Balogh, 1958. Localities: 1 (4 ex.), 2 (3 ex.), 4 (8 ex.), 5 (3 ex.). Distribution: Ethiopian region, India.

Oppiidae

Arcoppia arborea Ermilov, Sidorchuk & Rybalov, 2010. Locality: 6 (3 ex.). Distribution: Ethiopia.

Arcoppia rugosa (Mahunka, 1974). Localities: 5 (2 ex.), 6 (1 ex.). Distribution: Ethiopian region.

Neoamerioppia polygonata (Mahunka, 1982). Localities: 1 (5 ex.), 2 (12 ex.), 3 (18 ex.), 4 (10 ex.), 5 (19 ex.), 6 (8 ex.), 7 (16 ex.). Distribution: Ethiopian region.

Oppiella nova (Oudemans, 1902). Locality: 4 (1 ex.). Distribution: Cosmopolitan.

Paroppia breviseta (Balogh, 1962). Locality: 2 (11 ex.). Distribution: Ethiopian region.

Rugoppia luisiae Mahunka, 1986. Locality: 1 (2 ex.). Distribution: Tanzania. New record of the genus and species in Ethiopia.

Striatoppia margaritifera Balogh & Mahunka, 1966. Localities: 5 (1 ex.), 7 (1 ex.). Distribution: Congo. New record of the species in Ethiopia.

Wallworkoppia minima (Ermilov, Rybalov & Hun-dama, 2014). Locality: 6 (2 ex.). Distribution: Ethiopia.

Suctobelidae

Suctobelbella (Ussuribata) spirochaeta Mahunka, 1983. Localities: 5 (1 ex.), 6 (1 ex.). Distribution: Ethiopian region, Japan.

Dampfiellidae

Beckiallorella opposita Mahunka, 1982. Locality: 6 (3 ex.). Distribution: Ethiopia.

Otocepheidae

Dolicheremaeus capillatus (Balogh, 1959). Locality: 4 (1 ex.). Distribution: Ethiopian region, Vietnam.

Leptocepheus macromucronatus Mahunka, 1988. Localities: 6 (1 ex.), 7 (2 ex.). Distribution: Tanzania. New record of the genus and species in Ethiopia.

Tectocepheidae

Tectocepheus velatus sarekensis Trägårdh, 1910. Localities: 2 (2 ex.), 3 (1 ex.), 5 (1 ex.), 6 (2 ex.). Distribution: Cosmopolitan.

Microzetidae

Berlesezetes ornatissimus (Berlese, 1913). Localities: 1 (1 ex.), 4 (1 ex.), 5 (1 ex.), 6 (1 ex.), 7 (2 ex.). Distribution: Cosmopolitan.

Phenopelopidae

Eupelops torulosus (Koch, 1839). Locality: 6 (6 ex.). Distribution: Palaearctic region, Ethiopia.

Humerobatidae

Humerobates africanus (Mahunka, 1984). Locality: 2 (1 ex.). Distribution: Ethiopian region.

Puncitoribatidae

Allozetes africanus Balogh, 1958. Locality: 6 (4 ex.). Distribution: Paleotropical region.

Lamellobates molecula (Berlese, 1916). Locality: 4 (1 ex.). Distribution: tropics and subtropics.

Mochlozetidae

Inguizetes atypicus (Mahunka, 1982). Locality: 3 (1 ex.). Distribution: Ethiopian region.

Scheloribatidae

Euscheloribates sp. Locality: 7 (4 ex.). New record of the genus in Ethiopia.

Muliercula bilineata Mahunka, 1986. Localities: 5 (9 ex.), 6 (8 ex.). Distribution: Tanzania. New record of the genus and species in Ethiopia.

Muliercula sp. Localities: 5 (7 ex.), 6 (12 ex.).

Scheloribates aethiopicus Mahunka, 1982. Locality: 6 (5 ex.). Distribution: Ethiopian region, Canary Islands.

Scheloribates discifer Balogh, 1959. Localities: 4 (2 ex.), 7 (1 ex.). Distribution: Ethiopian region.

Scheloribates fimbriatus Thor, 1930. Localities: 2 (4 ex.), 7 (10 ex.). Distribution: tropics, subtropics.

Scheloribates laevigatus (Koch, 1835). Localities: 2 (1 ex.), 3 (1 ex.), 4 (2 ex.), 5 (5 ex.), 7 (2 ex.). Distribution: Semicosmopolitan.

Scheloribates leleupi Balogh, 1959. Localities: 2 (13 ex.), 3 (4 ex.), 4 (12 ex.), 5 (9 ex.), 6 (16 ex.). Distribution: Ethiopian region. New record of the species in Ethiopia.

Scheloribates perisi Pérez-Íñigo, 1982. Locality: 2 (2 ex.). Distribution: Ethiopian region. New record of the species in Ethiopia.

Scheloribates praeincisus (Berlese, 1910). Localities: 2 (3 ex.), 5 (4 ex.), 6 (3 ex.). Distribution: tropics, subtropics.

Scheloribates (Bischeloribates) munesaensis Ermilov, 2016. Localities: 2 (2 ex.), 6 (2 ex.). Distribution: Ethiopia.

Haplozetidae

Peloribates consectionus Mahunka & Mahunka-Papp, 2008. Locality: 4 (1 ex.). Distribution: Ethiopian region.

Protoribates paracapucinus (Mahunka, 1988). Locality: 5 (3 ex.). Distribution: Oriental, Palaearctic, Ethiopian, Australian and Neotropical regions. New record of the species in Ethiopia.

Pilobatella sp. Localities: 4 (3 ex.), 5 (6 ex.), 7 (4 ex.).

Galumnidae

Dimidiogalumna villiersensis Engelbrecht, 1972. Locality: 4 (3 ex.). Distribution: Ethiopian region.

Galumna incisa Mahunka, 1982. Localities: 2 (2 ex.), 3 (2 ex.), 4 (9 ex.), 5 (6 ex.). Distribution: Ethiopia.

Galumna nuda Engelbrecht, 1972. Localities: 5 (1 ex.), 6 (2 ex.), 7 (1 ex.). Distribution: Ethiopian region, Peru.

Galumna sp. Locality: 7 (2 ex.).

Pergalumna pocsi Mahunka, 1984. Localities: 2 (2 ex.), 4 (9 ex.), 5 (2 ex.), 6 (5 ex.). Distribution: Ethiopian region. New record of the species in Ethiopia.

Pilizetes anufrievi Ermilov, Sidorchuk & Rybalov, 2010. Localities: 4 (1 ex.), 7 (2 ex.). Distribution: Ethiopia.

Pilogalumna ornatula Grandjean, 1956. Locality: 7 (7 ex.). Distribution: Mediterranean, Mexico, Ethiopia.

Taeniogalumna sphaerula Balogh, 1962. Locality: 7 (3 ex.). Distribution: Tanzania. New record of the species in Ethiopia.

Trichogalumna nipponica (Aoki, 1966). Localities: 2 (7 ex.), 4 (5 ex.), 5 (2 ex.), 6 (14 ex.), 7 (11 ex.). Distribution: Semicosmopolitan.

Galumnellidae

Galumnella apiculata Mahunka, 1992. Localities: 2 (3 ex.), 3 (3 ex.), 5 (3 ex.), 6 (1 ex.), 7 (4 ex.). Distribution: Ethiopian region.

Thus, the list of identified oribatid mites collected from the Dhati-Walal National Park in Ethiopia includes 56 species from 46 genera and 25 families. Of these, 10 species (*Eremulus avenifer*, *Rugopippia luisiae*, *Striatoppia margaritifera*, *Leptotocepehus macromucronatus*, *Muliercula bilineata*, *Scheloribates leleupi*, *Scheloribates perisi*, *Protoribates paracapucinus*, *Pergalumna pocsi* and *Taeniogalumna sphaerula*) and 4 genera (*Rugopippia*, *Leptotocepehus*, *Euscheloribates*, *Muliercula*) are recorded for the first time in the fauna of this country.

Descriptions

***Sadocepheus dhatiwalalensis* Ermilov sp. nov.**
Figs 1–12

Diagnosis. Body size: 846–929 × 581–713. Lamellae truncate distally. Rostral setae erect, slightly barbed, lamellar setae thicker, distinctly barbed, directed medial, interlamellar setae shortest, smooth. Bothridial setae long, erect, brush-shaped. Notogastral and anooadanal setae short, setiform, smooth. Leg claws slightly barbed on dorsal side. Leg trochanters III, IV with strong tooth dorsoanteriorly.

Description

Measurements. Body length: 879 (holotype, male), 846–929 (8 paratypes, all males); notogaster width: 647 (holotype), 581–713 (8 paratypes).

Integument. Body colour dark brown. Body surface densely microfoveolate (visible under high magnification in dissected specimens) and is covered by thick layer of amorphous cerotegument. Pedotecta I rugose and partially tuberculate.

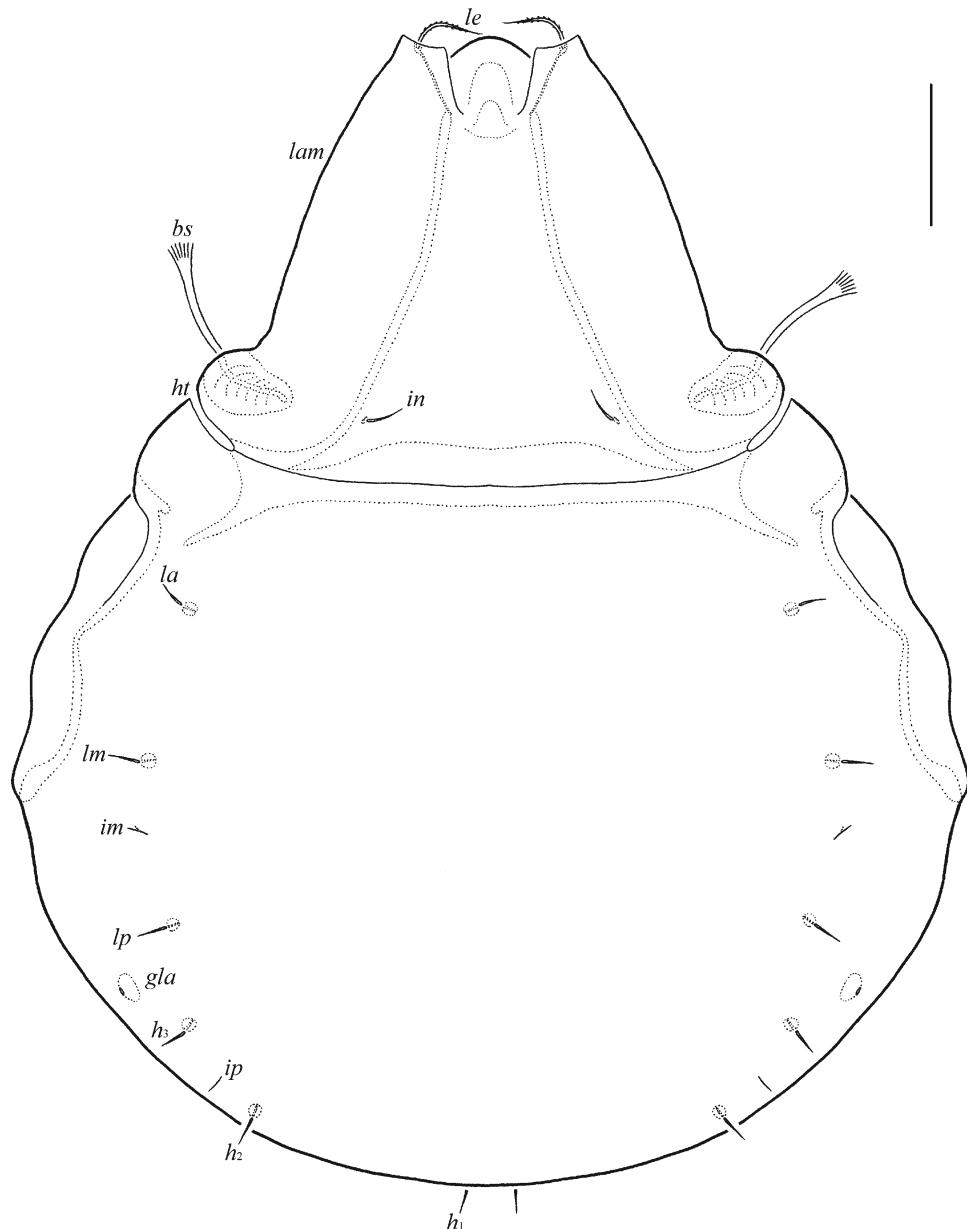


Fig. 1. *Sadocepehus dhativalalensis* Ermilov sp. nov., adult: dorsal view. Scale bar 100 μm .

Prodorsum (Figs 1–3). Rostrum rounded. Lamellae truncate distally, with slightly developed medial and lateral teeth. Rostral setae (45–57) setiform, erect, slightly barbed. Lamellar setae (53–61) setiform, thicker than rostral setae, distinctly barbed, curved in basal part and directed medially. Interlamellar setae (20–24) setiform, thin, smooth. Bothridial setae (90–98) erect, with long stalk and

short, brush-like head. Exobothridial setae and their alveoli absent. Tutoria strong, triangular distally.

Notogaster (Figs 1–5). Anterior margin of notogaster slightly concave medially. Humeral regions triangularly pointed. Nine pairs of notogastral setae (16–24) setiform, smooth, inserted on the notogastral surface, usually p_1 , p_2 and p_3 slightly shorter than others. All lyrifissures distinct, ia in humeral position,

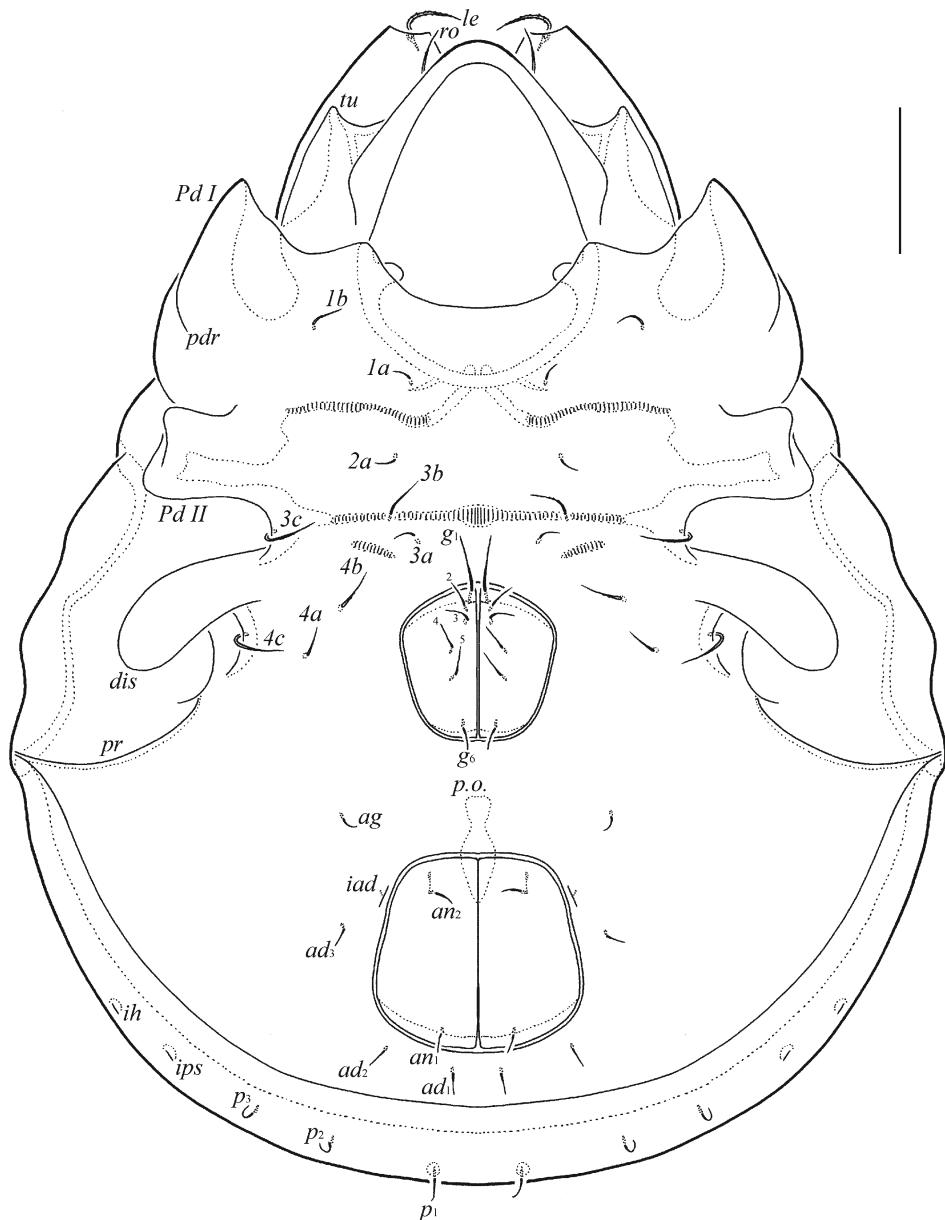
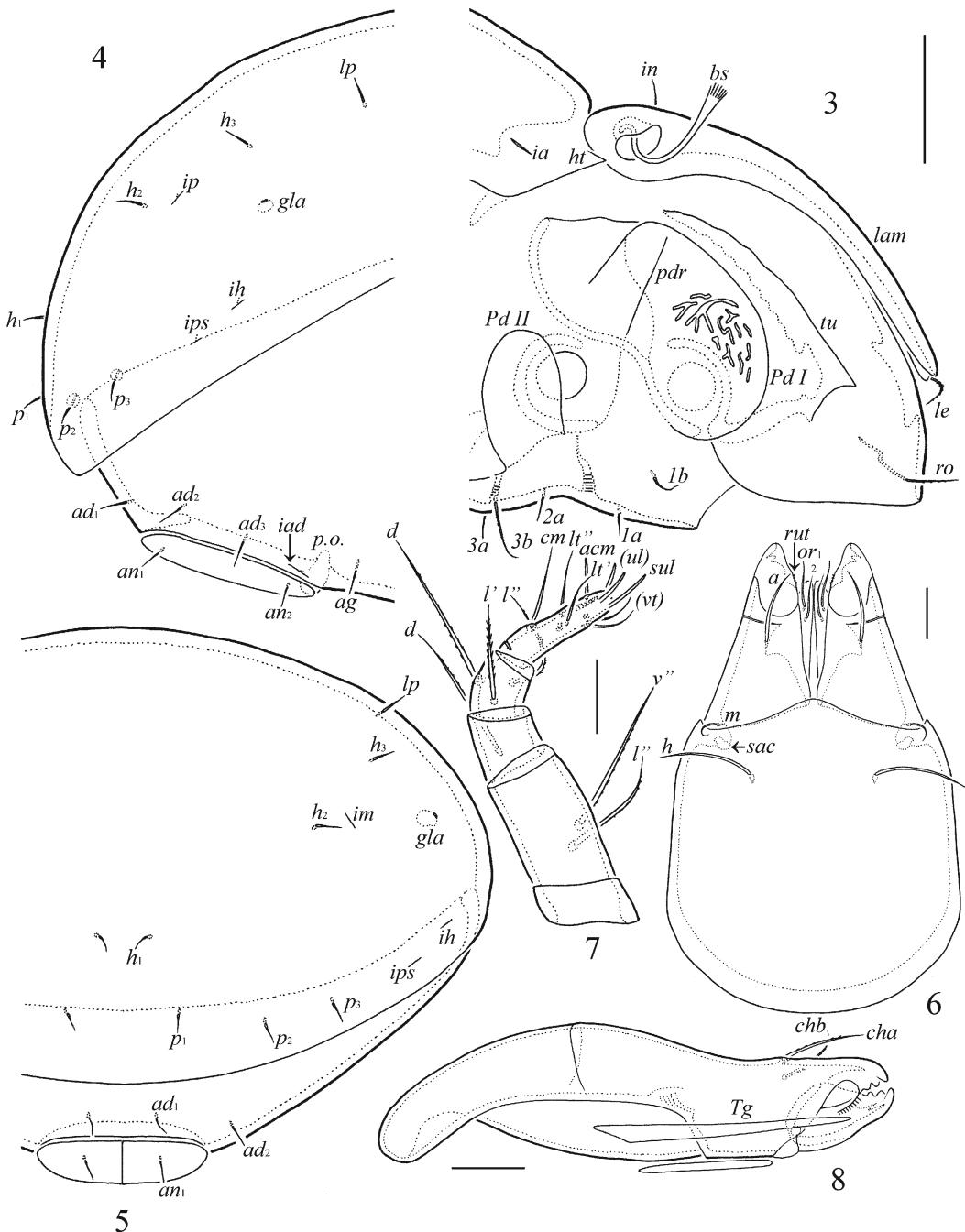


Fig. 2. *Sadocopeus dhatiwaleensis* Ermilov sp. nov., adult: ventral view (gnathosoma and legs not shown). Scale bar 100 μm .

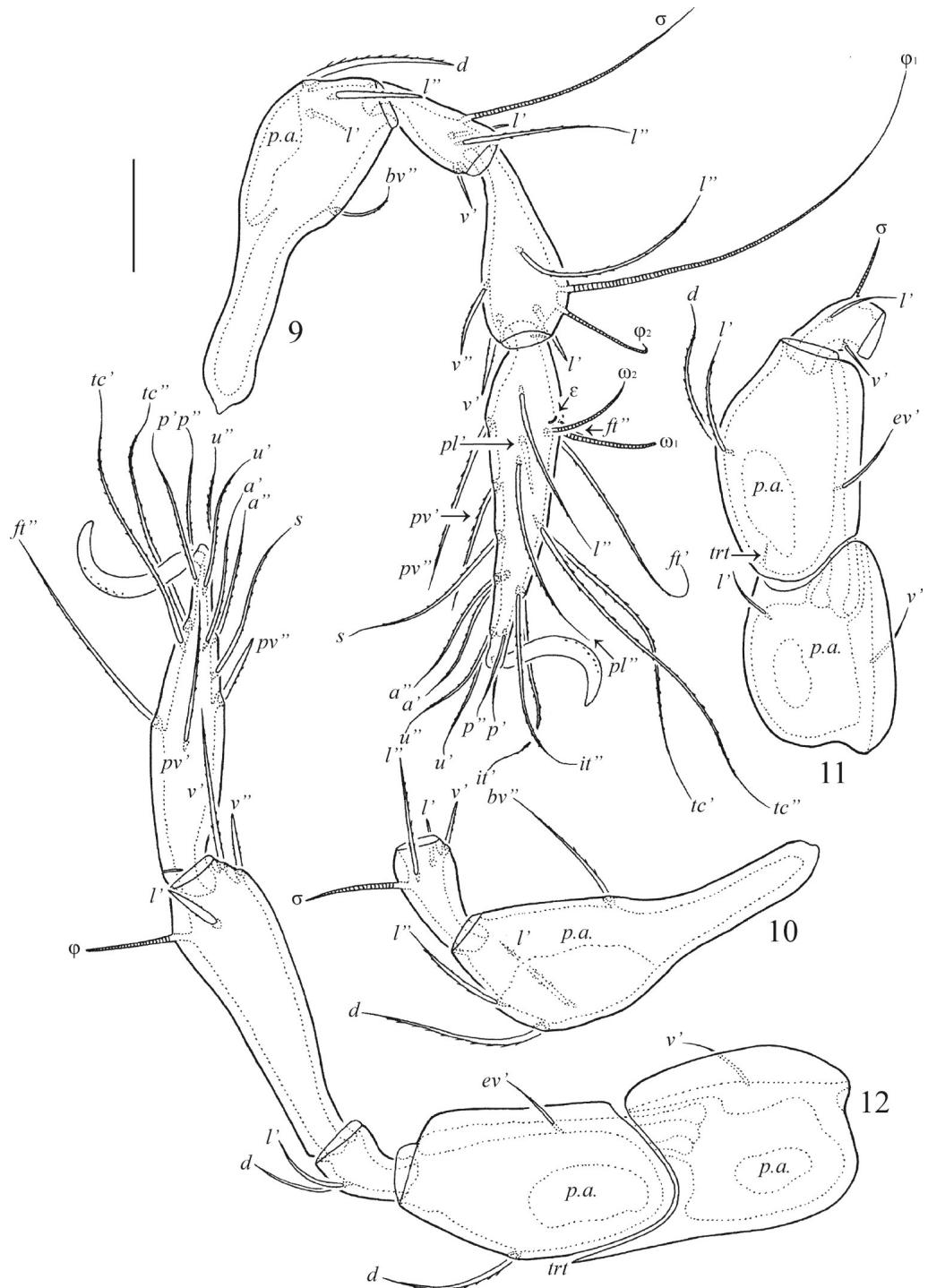
im located between *lm* and *lp*, *ip* between *h₂* and *h₃*, *ih* and *ips* in posterolateral position, anterior to *p₃*. Opisthonotal gland openings located posterolateral to *lp*.

Gnathosoma (Figs 6–8). Subcapitulum longer than wide (200–205 \times 110–118). Rutelli with small anteromedial teeth. Subcapitular setae setiform, smooth, *m* (12–16) shorter and thinner than *a* (28–32)

and *h* (32–41). Adoral setae (20) setiform, smooth. Palps (106–110) with typical setation 0–2–1–3–9(+ ω). Postpalpal setae (10) spiniform, smooth. Axillary sacculi distinct, slightly elongated. Chelicerae (172–176) with two setiform, barbed setae (24–28). Trägårdh's organ of chelicerae narrowly tapered.



Figs 3-8. *Sadocopeus dhatiwalensis* Ermilov sp. nov., adult: 3. anterior part of body (gnathosoma and legs not shown), lateral view; 4. posterior part of body, lateral view; 5. posterior view (left half not shown partially); 6. subcapitulum, ventral view; 7. palp, left, paraxial view; 8. chelicera, left, paraxial view. Scale bar 100 µm (3-5), 20 µm (6-8).



Figs 9–12. *Sadocepheus dhatiwalaleensis* Ermilov sp. nov., adult: 9. leg I, without trochanter, right, antiaxial view; 10. femur and genu of leg II, right, antiaxial view; 11. trochanter, femur and genu of leg III, left, antiaxial view; 12. leg IV, left, antiaxial view. Scale bar 50 µm.

Epimeral and lateral podosomal regions (Figs 2, 3). Sejugal border complete, apodemal border II and III well visible. Epimeral setal formula: 2–1–3–3; setae 1c and their alveoli absent. Setae setiform, 1a, 2a, 3a and 4a (16–20) smooth, others (1b, 3b, 4b, 28–32; 3c, 4c, 53–57) slightly barbed. Pedotecta I with transverse ridge. Pedotecta II rectangular. Discidia elongate, rounded distally. Podosomal ridges (between notogaster and acetabula IV) well-developed.

Anogenital region (Figs 2, 4, 5). Six pairs of genital (g_1 , 45–53, g_2 – g_6 , 16–20), one pair of aggenital (16–20), three pairs of adanal (16–20) and two pairs of anal (16–20) setae setiform, smooth. Adanal lyrifissures located close and parallel to anal plates.

Legs (Figs 9–12). Claw of each leg slightly barbed on dorsal side. Trochanters III, IV with strong tooth dorsoanteriorly. Porose areas on all femora and on trochanters III, IV well visible. Formulas of leg setation and solenidia: I (1–4–3–4–19) [1–2–2], II (1–4–3–4–16) [1–1–2], III (2–3–2–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 1.

Material examined. Holotype (male) and 8 paratypes (all males): Ethiopia, Dhati-Walal National Park, 9°23' 54.7"N, 34°40'10.7"E, forest with *Schefflera* and *Coffee*, litter, 19.X.2017 (collected by L. B. Rybalov).

Type deposition. The holotype (ethanol with drop of glycerol) is deposited in SMNH. Eight paratypes (ethanol with drop of glycerol) are deposited in TSUMZ.

Etymology. The specific name *dhativalalensis* refers to the Dhati-Walal National Park, where the new species was collected.

Remarks. *Sadocepheus dhativalalensis* Ermilov sp. nov. is morphologically most similar to *Sadocepheus subniger* (Ewing, 1917) from the USA (Ewing 1917, Woolley 1957) in the presence of short notogastral setae. However, the new species differs by the larger body size (846–929 × 581–713 versus 720–771 × 542–570), truncate lamellar cusps with lateral and medial points (versus rounded) and brush-shaped, erect bothridial setae (versus clavate, distinctly directed posterolaterad).

Scheloribates leleupi Balogh, 1959

Figs 13–24

Supplementary description

Measurements. Body length: 597–664 (54 specimens: 32 females and 22 males); notogaster width: 365–431 (54 specimens). No clear difference between females and males in body size, but females usually larger.

Integument. Body colour light brown to brown. Body surface densely microfoveolate (visible under high magnification). Lateral parts of prodorsum between sublamellae and acetabula I, II slightly microgranulate.

Prodorsum (Figs 13, 15). Rostrum rounded. Lamellae shorter than half of prodorsum (measured in lateral view). Translamella present, shortly interrupted medially. Prolamellae complete. Sublamellae thin, similar to lamellae in length. Sublamellar porose areas (8–12), rounded. Lateral keel-shaped ridges well-developed. Rostral (69–73), lamellar (102–110) and interlamellar (127–135) setae setiform, erect, barbed. Bothridial setae (135–143) with long, slightly barbed stalk and short, narrowly lanceolate, barbed head having distinct thin apex. Dorsosejugal porose areas narrowly elongate oval (12–16 × 2–4). Exobothridial setae (45–53) setiform, barbed.

Notogaster (Figs 13–17). Anterior notogastral margin slightly convex medially. Ten pairs of notogastral setae long (102–110), setiform, barbed. Four pairs of sacculi with small openings and short channels. Distance $S1$ – $S1$ shorter than $S2$ – $S2$. Setae lm inserted anteromedial to Sa , lp medial to $S1$. All lyrifissures distinct, ia in humeral position, im located anterolateral to h_3 , ip between p_1 and p_2 , ih anterolateral to p_3 , ips posterolateral to p_3 . Opisthonal gland openings located posterior and close to im . Circumgastric scissure and circumgastric sigillar band distinct.

Gnathosoma (Figs 18–20). Subcapitulum longer than wide (131–135 × 77–82). Subcapitular setae setiform, barbed, m (10–12) shorter than a (16–20) and h (32–36). Two pairs of adoral setae (12) setiform, heavily barbed. Palps (length 77–82) with setation 0–2–1–3–9(+ω). Postpalpal setae (4) spiniform, smooth.

Table 1. Leg setation and solenidia of adult *Sadocepheus dhativalalensis* Ermilov sp. nov. Roman letters refer to normal setae, Greek letters to solenidia (except ε = famulus). Single prime (') marks setae on anterior and double prime (") setae on the posterior side of the given leg segment. Parentheses refer to a pair of setae.

Leg	Tr	Fe	Ge	Ti	Ta
I	v'	d , (l), bv''	(l), v', σ	(l), (v), ϕ_1 , ϕ_2	(ft), (tc), (it), (p), (u), (a), s, (pv), (pl), l'', ε, ω ₁ , ω ₂
II	v'	d , (l), bv''	(l), v', σ	(l), (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv), l'', ω ₁ , ω ₂
III	l', v'	d , l', ev'	l', v', σ	l', (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv)
IV	v'	d , ev'	d, l'	l', (v), φ	ft'', (tc), (p), (u), (a), s, (pv)

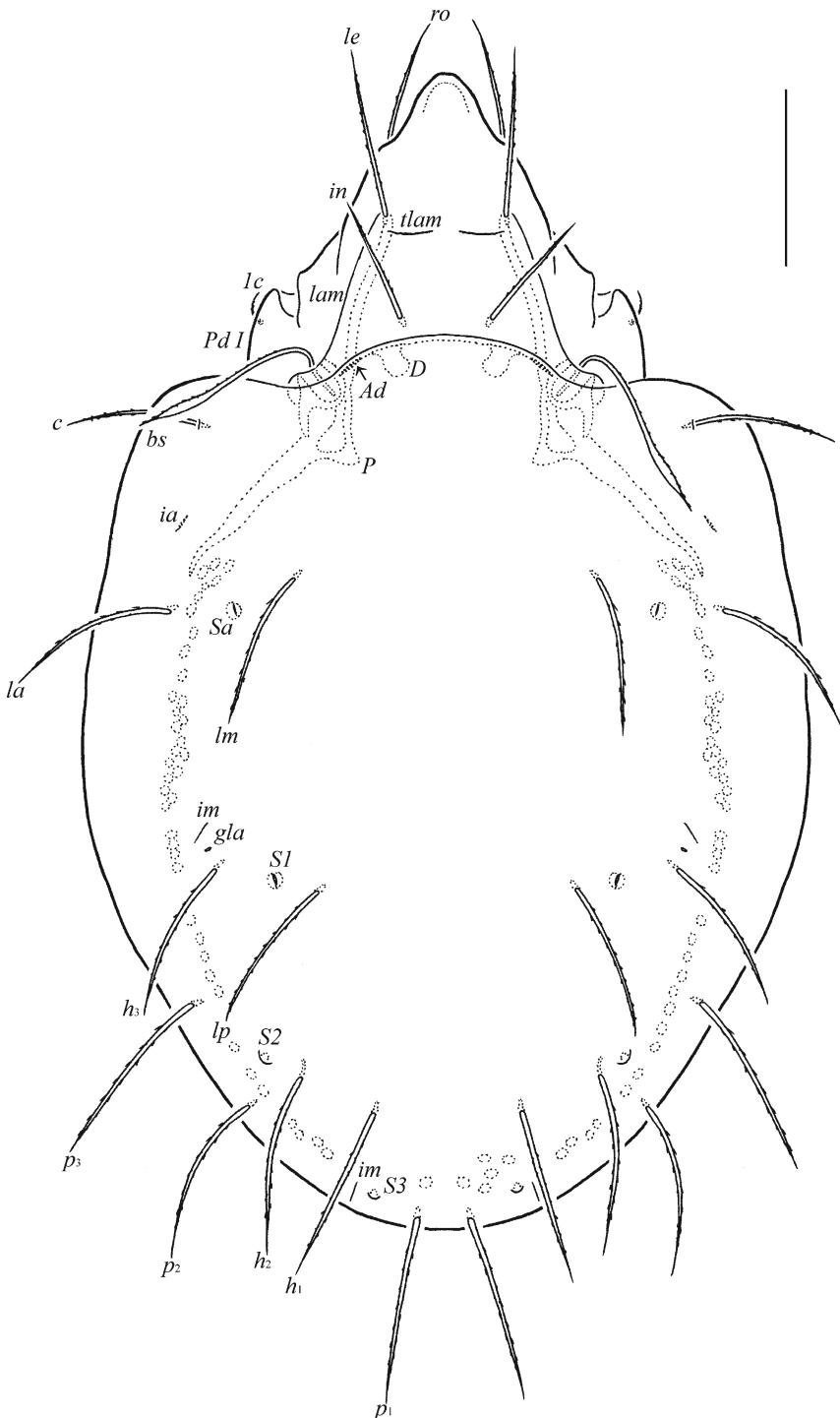


Fig. 13. *Scheloribates leleupi* Balogh, 1959, adult: dorsal view (legs not shown). Scale bar 100 µm.

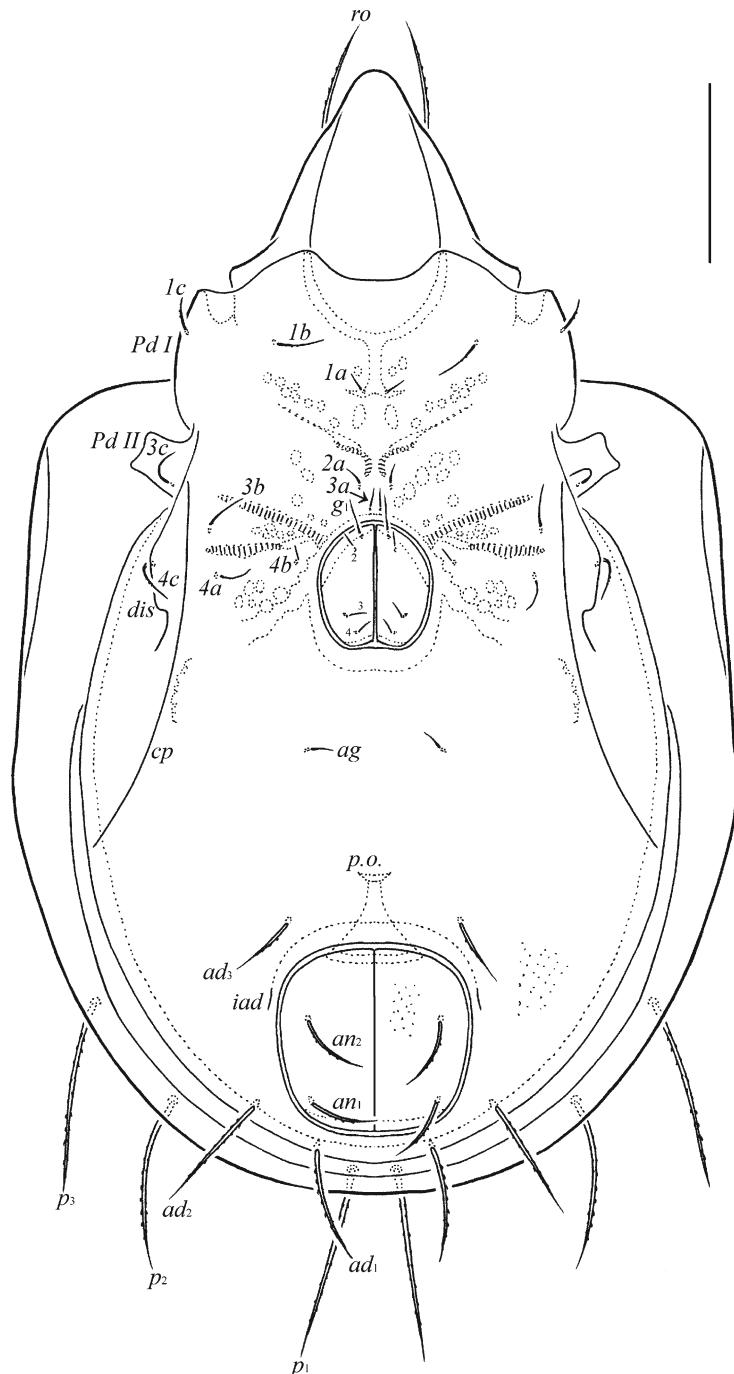
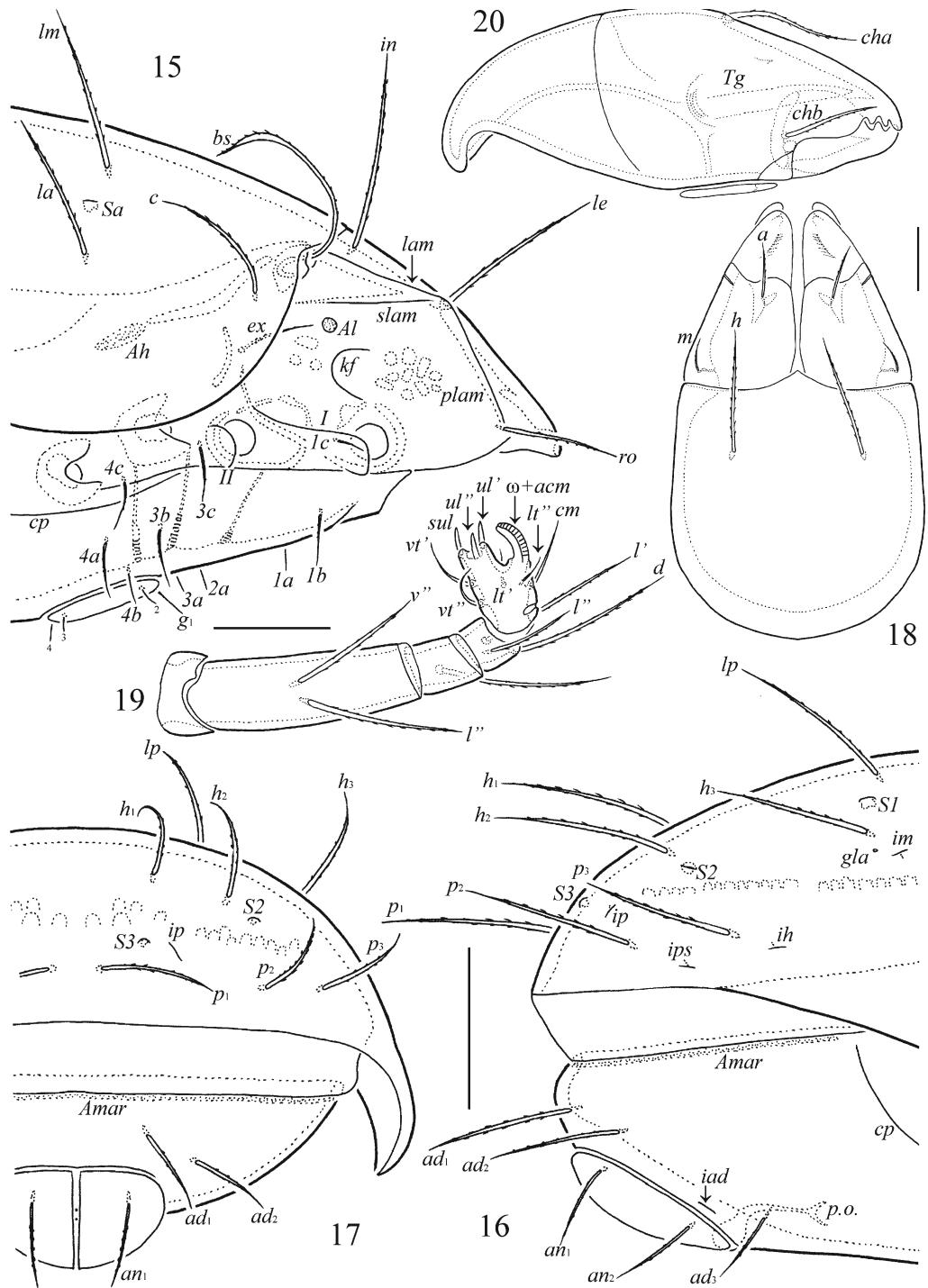


Fig. 14. *Scheloribates leleupi* Balogh, 1959, adult: ventral view (gnathosoma and legs not shown). Scale bar 100 µm.



Figs 15–20. *Scheloribates leleupi* Balogh, 1959, adult: 15. anterior part of body (gnathosoma and legs not shown), lateral view; 16. posterior part of body, lateral view; 17. posterior view (left half not shown partially); 18. subcapitulum, ventral view; 19. palp, left, antiaxial view; 20. chelicera, right, antiaxial view. Scale bar 100 µm (15–17), 20 µm (18–20).

Chelicerae (length 135–139) with two setiform, barbed setae, *cha* (41–45) longer than *chb* (28–32). Trägårdh's organ of chelicerae elongate triangular.

Epimeral and lateral podosomal regions (Figs 14, 15). Epimeral setal formula: 3–1–3–3. Epimeral setae setiform, slightly barbed; *1a*, *2a*, *3a* (16) shorter and thinner than *1c*, *4b* (20) and others (32–36). Humeral porose areas *Ah* developed. Pedotecta II trapezoid in ventral view. Discidia elongate triangular. Circumpedal carinae long, directed to pedotecta II.

Anogenital region (Figs 14–17). Four pairs of genital (*g₁*, 24; *g₂–g₄*, 14–16), one pair of aggenital (14–16), two pairs of anal (53–57) and three pairs of adanal (*ad₁*, *ad₂*, 90–94; *ad₃*, 53–57) setae setiform, barbed. Adanal lyrifissures located close and parallel to anal plates. Marginal porose area band-like.

Legs (Figs 21–24). Median claw thicker than lateral ones, all serrate on dorsal side; lateral claws with small tooth ventrodistally. Tibiae I and II with axe-like ventrobasal process. Dorsoparaxial porose areas on femora I–IV and on trochanters III, IV and ventral porose areas in basal parts of tarsi and in distal parts of tibiae well visible. Formulas of leg setation and solenidia: I (1–5–3–4–19) [1–2–2], II (1–5–2–4–15) [1–1–2], III (2–3–1–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 2.

Material examined. 54 specimens (32 females and 22 males): 13 specimens (9 females and 4 males): Ethiopia, Dhati-Walal National Park, 9°23'54.7"N, 34°40'10.7"E, forest with *Schefflera* and *Coffee*, litter, 19.X.2017 (collected by L. B. Rybalov); 4 specimens (2 females and 2 males): Ethiopia, Dhati-Walal National Park, 9°23'54.7"N, 34°40'10.7"E, forest with *Schefflera* and *Coffee*, moss on trees, 19.X.2017 (collected by L. B. Rybalov); 12 specimens (6 females and 6 males): Ethiopia, Dhati-Walal National Park, 9°26'33.7"N, 34°47'22.5"E, mixed deciduous forest in the valley, litter, 27.X.2017 (collected by L. B. Rybalov); 9 specimens (5 females and 4 males): Ethiopia, Dhati-Walal National Park, 9°26'35.5"N, 34°48'07.6"E, rarefied forest with needle leaves bush, litter, 27.X.2017 (collected by L. B. Rybalov); 16 specimens (10 females and 6 males): Ethiopia, Dhati-Walal National Park, 9°26'34.6"N, 34°48'02.1"E, bamboo forest, litter, 20.X.2017 (collected by L. B. Rybalov).

Remarks. Specimens of *Scheloribates leleupi* from Ethiopia are completely similar to specimens from Congo in the original description (Balogh 1959). Based on the supplementary description (our data above) and known literature data (Balogh 1959), we propose the following diagnostic morphological traits for this species: body size 570–664 × 365–436; rostrum rounded; translamella present, shortly interrupted medially; prolamellae complete; rostral, lamellar and interlamellar setae setiform, erect, barbed, *ro* shortest, *in* longest; bothridial setae with long stalk and short, narrowly lanceolate, barbed head having distinct apex; exobothridial setae comparatively long; notogastral setae long, setiform, barbed; four pairs of small sacculi present; epimeral, genital and aggenital setae short, setiform, slightly barbed; circumpedal carinae long, directed to pedotecta II; anal and adanal setae long, setiform, barbed; leg tibiae I and II with axe-like ventrobasal process.

Galumna incisa Mahunka, 1982

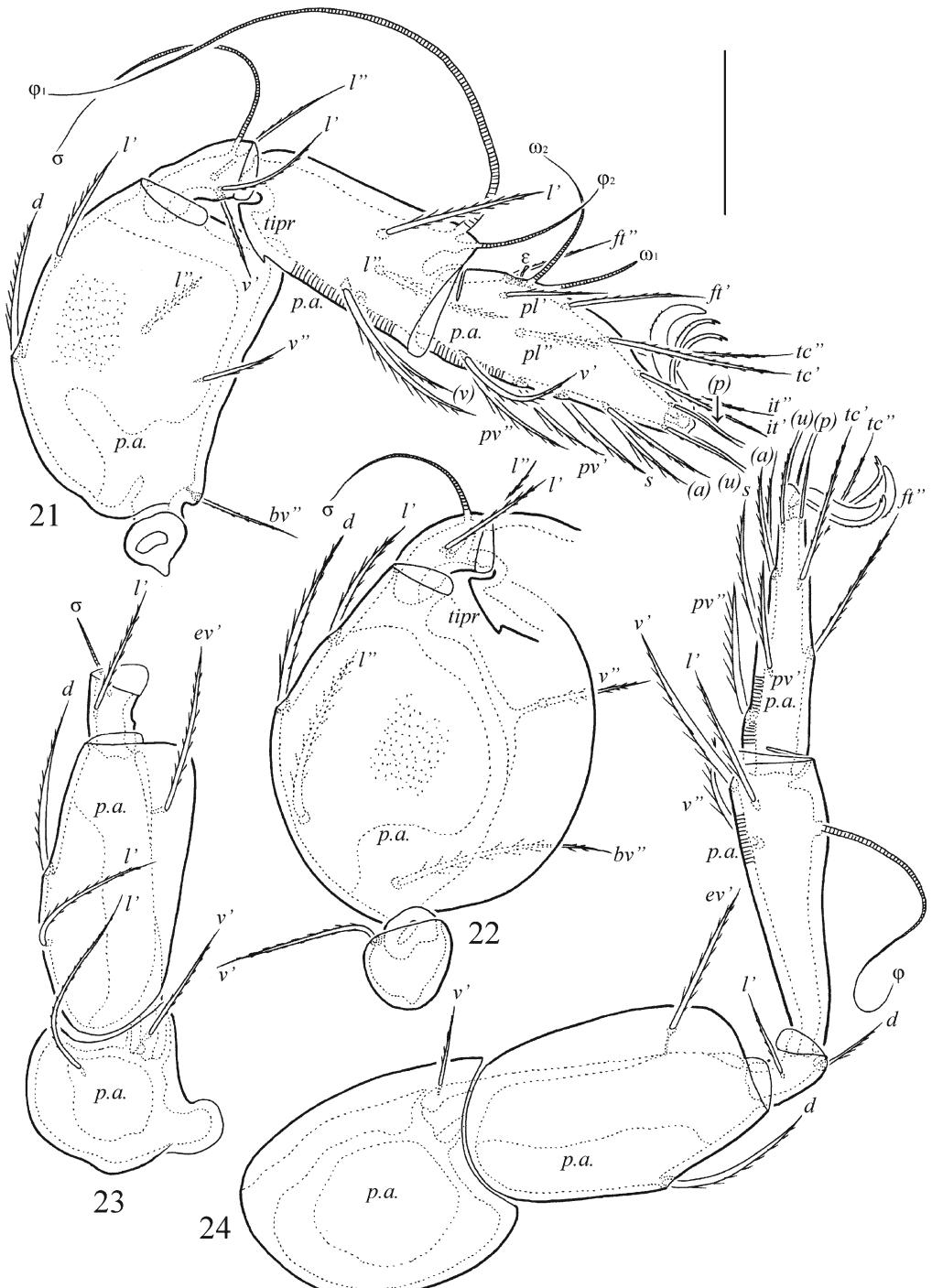
Figs 25–29

Material examined. 19 specimens (10 females and 9 males): 2 specimens (1 female and 1 male): Ethiopia, Dhati-Walal National Park, 9°23'54.7"N, 34°40'10.7"E, forest with *Schefflera* and *Coffee*, litter, 19.X.2017 (collected by L. B. Rybalov); 2 specimens (1 female and 1 male): Ethiopia, Dhati-Walal National Park, 9°23'54.7"N, 34°40'10.7"E, forest with *Schefflera* and *Coffee*, moss on trees, 19.X.2017 (collected by L. B. Rybalov); 9 specimens (5 females and 4 males): Ethiopia, Dhati-Walal National Park, 9°26'33.7"N, 34°47'22.5"E, mixed deciduous forest in the valley, litter, 27.X.2017 (collected by L. B. Rybalov); 6 specimens (3 females and 3 males): Ethiopia, Dhati-Walal National Park, 9°26'35.5"N, 34°48'07.6"E, rarefied forest with needle leaves bush, litter, 27.X.2017 (collected by L. B. Rybalov).

Remarks. *Galumna incisa* was described by Mahunka (1982) from Ethiopia. Our Ethiopian specimens of this species are morphologically identical in general appearance to those from the original description: body of medium size; rostrum rounded; lamellar and sublamellar lines parallel, curving backwards; rostral, lamellar and interlamellar setae well-developed, setiform, barbed, *ro* shortest, *in* longest; bothridial

Table 2. Leg setation and solenidia of adult *Scheloribates leleupi* Balogh, 1959. See Table 1 for explanations.

Leg	Tr	Fe	Ge	Ti	Ta
I	<i>v'</i>	<i>d</i> , (<i>I</i>), <i>bv'', v''</i>	(<i>I</i>), <i>v'</i> , σ	(<i>I</i>), (<i>v</i>), ϕ_1 , ϕ_2	(<i>ft</i>), (<i>tc</i>), (<i>it</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>), (<i>pl</i>), <i>v'</i> , ϵ , ω_1 , ω_2
II	<i>v'</i>	<i>d</i> , (<i>I</i>), <i>bv'', v''</i>	(<i>I</i>), <i>v'</i> , σ	(<i>I</i>), (<i>v</i>), ϕ	(<i>ft</i>), (<i>tc</i>), (<i>it</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>), ω_1 , ω_2
III	<i>l', v'</i>	<i>d</i> , <i>l'</i> , <i>ev'</i>	<i>l'</i> , σ	<i>l'</i> , (<i>v</i>), ϕ	(<i>ft</i>), (<i>tc</i>), (<i>it</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>)
IV	<i>v'</i>	<i>d</i> , <i>ev'</i>	<i>d</i> , <i>l'</i>	<i>l'</i> , (<i>v</i>), ϕ	<i>ft'', (tc)</i> , (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>)



Figs 21–24. *Scheloribates leleupi* Balogh, 1959, adult: 21. leg I, without trochanter, left, paraxial view; 22. trochanter, femur and genu of leg II, left, paraxial view; 23. trochanter, femur and genu of leg III, left, antiaxial view; 24. leg IV, right, antiaxial view. Scale bar 50 µm.

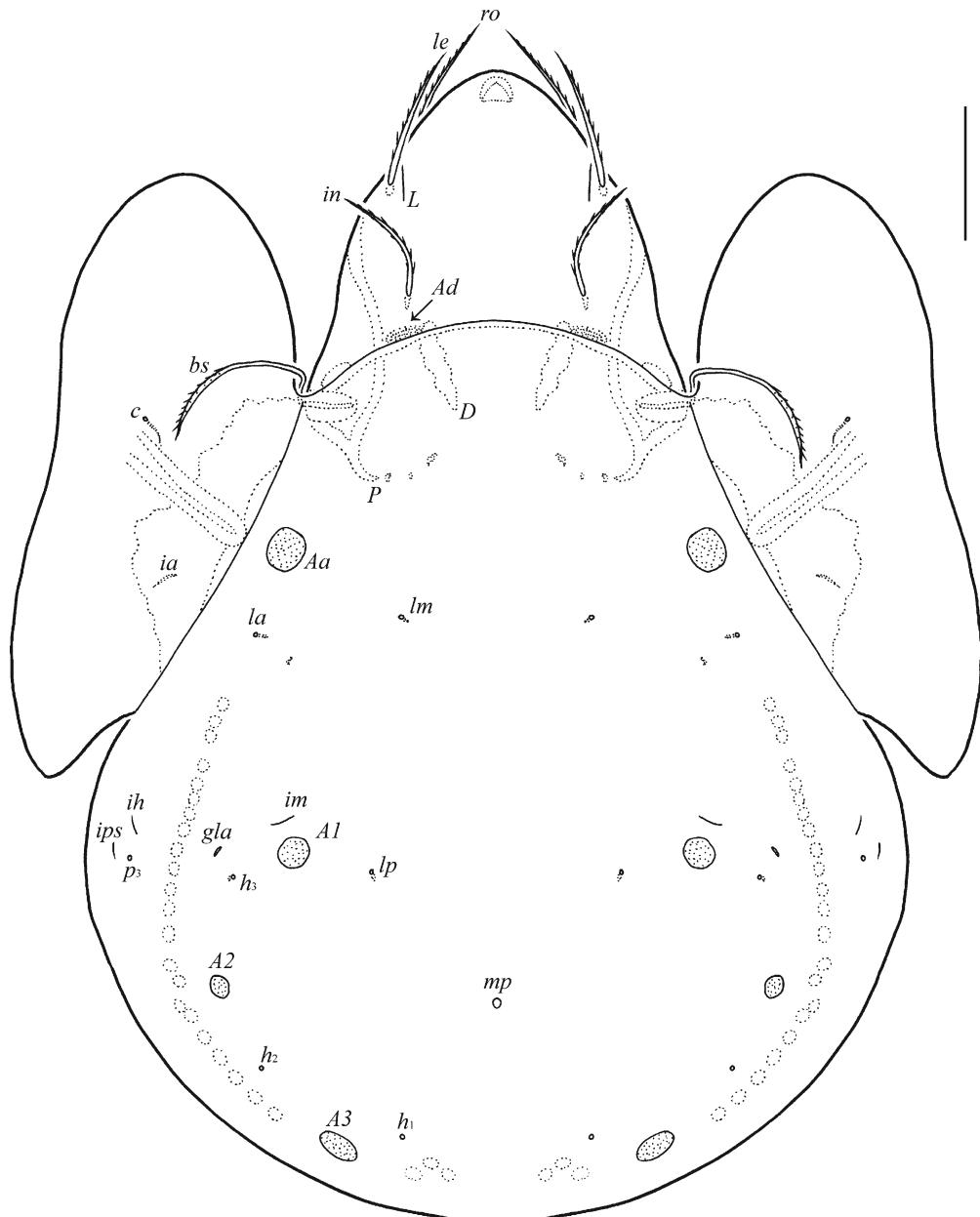


Fig. 25. *Galumna incisa* Mahunka, 1982, adult: dorsal view. Scale bar 50 µm.

setae with long stalk and short, lanceolate, barbed head; sejugal porose areas and dorsosejugal suture present; basal part of pteromorphs bordered; notogaster with four pairs of rounded porose areas, *Aa* located close to pteromorphal hinges; median pore located between *A2*; lyrifissures *im* located anterior and close to *A1*; epimeral and anogenital setae short,

ad₃ inserted close to *iad*; postanal porose area elongate oval. However, one very important difference is present; specimens of *G. incisa* from the original description (Mahunka 1982) have sexual dimorphism: posterior margin of notogaster incised and postanal porose area absent in males. All our specimens from Ethiopia (also including early materials from dif-

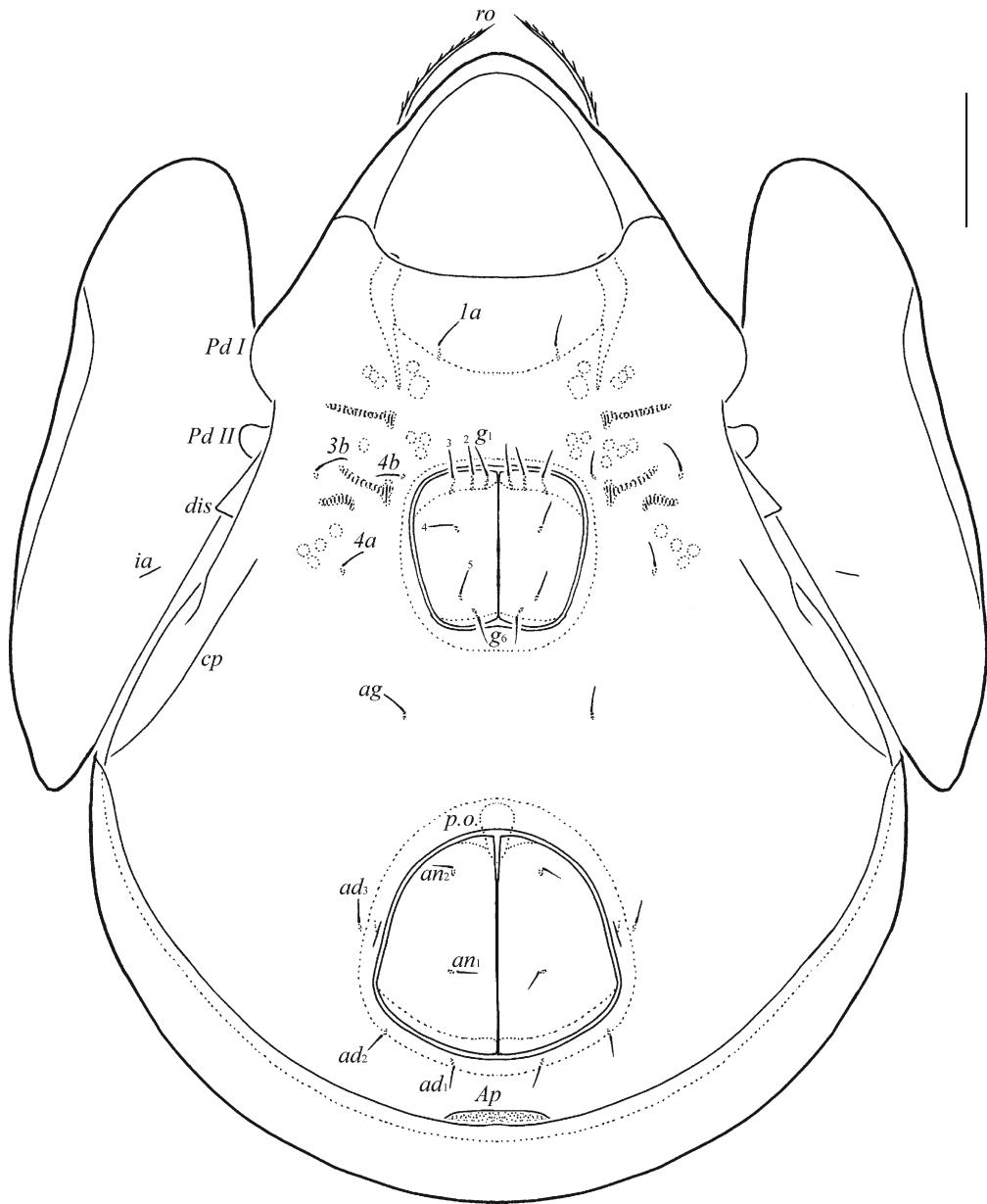
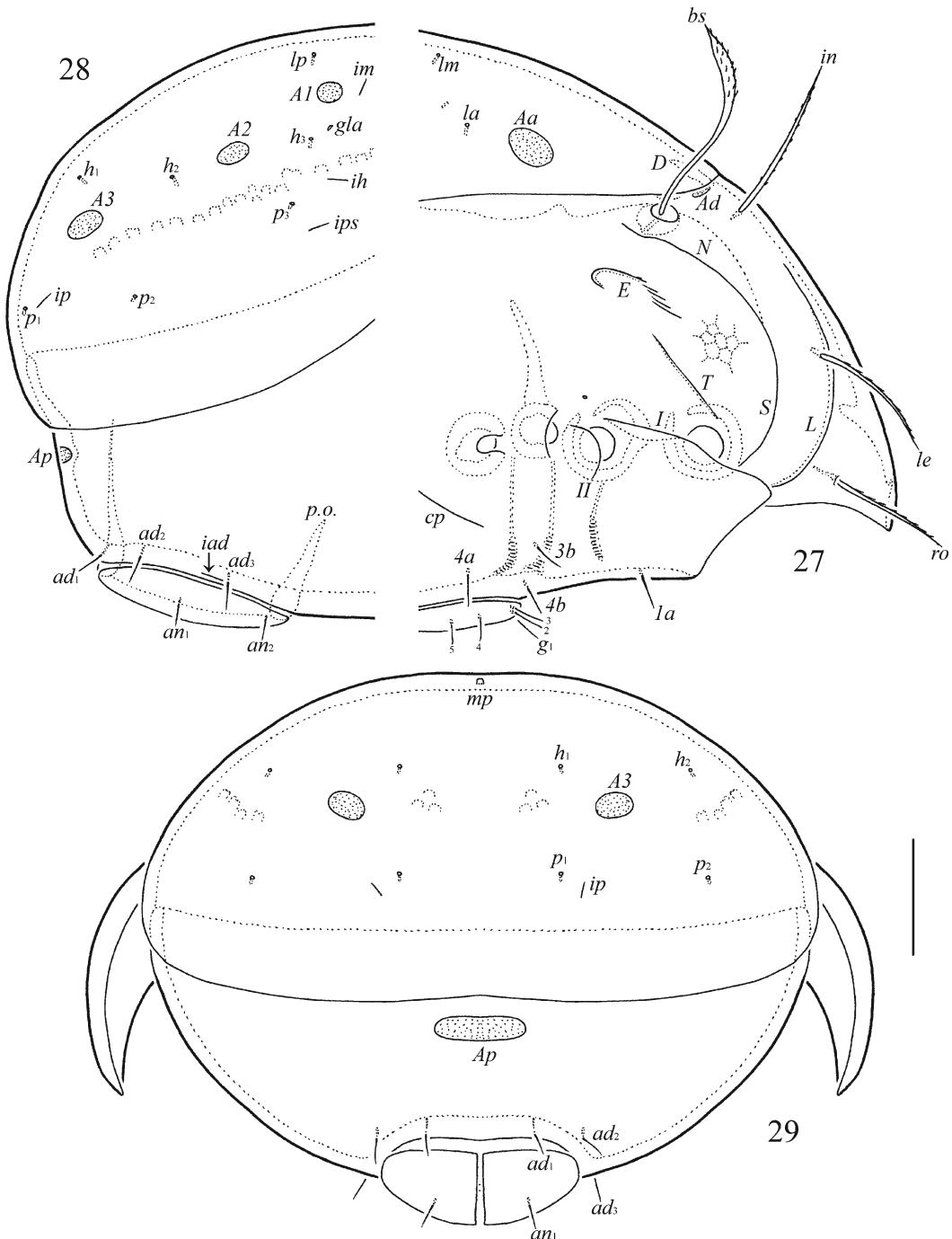


Fig. 26. *Galumna incisa* Mahunka, 1982, adult: ventral view (gnathosoma and legs not shown). Scale bar 50 μm .

ferent localities, e.g., Ermilov et al. 2014, Ermilov 2016a,b) have no sexual dimorphism, females and males are identical in morphological traits.

Thus, the situation with the identification of our specimens of *G. incisa* is problematic. It is possible that *G. incisa* may have dimorphic males. Also, it is possible, that Mahunka's and our species belong-

ing to very closely related species. Due to the lack of morphological differences (excluding sexual dimorphism) between Mahunka's and our species, we continue (in addition to Ermilov et al. 2014, Ermilov 2016a,b) to identify our specimens as *G. incisa*, however additional researches (for example, genetic) are necessary.



Figs 27–29. *Galumna incisa* Mahunka, 1982, adult: 27. anterior part of body (gnathosoma and legs not shown), lateral view; 28. posterior part of body, lateral view; 29. posterior view. Scale bar 50 µm.

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